Strategies for Getting Started with IPv6

IPv6 Transition Acceleration Options for
Web Applications and Services

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Advantages of Edge Approach

- Perimeter servers and services can remain IPv4-Only for some time.

- IPv6 capability is quickly configurable without overhauling entire perimeter.
  - IPv6 configuration required on Internet perimeter router and firewall
    - Most routers and firewalls support IPv6
  - Deployment of Server Load Balancing (SLB) or Application Delivery Controller (ADC) platform
    - Positions perimeter systems for Web Application Firewall (WAF) and Geographical SLB (GSLB)

IPv4/IPv6 Translation/Proxy

- If you want to keep your Internet perimeter applications using IPv4 then you could use an Application Layer Gateway (ALG) or Application Layer Proxy
  - These systems can terminate an IPv4 connection and initiate an IPv6 connection or terminate an IPv6 connection and initiate an IPv4 connection
- Protocol Translation is typically a last-resort migration strategy
- Proxy is OK

IPv4

IPv4

IPv6

IPv6

IPv4/v6 Proxy Translator
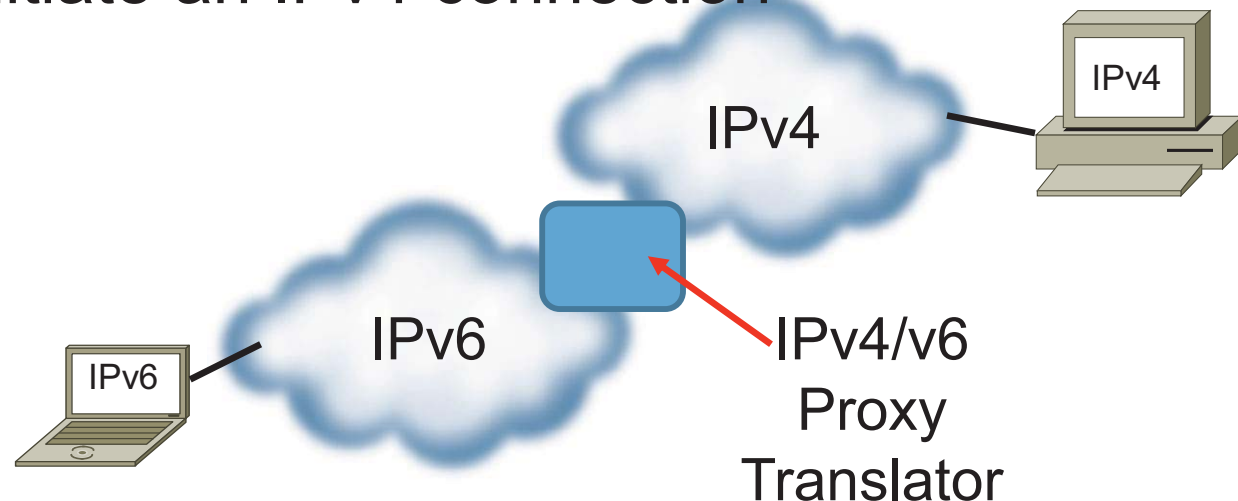
IPv4/IPv6 Proxy

- IPv4/IPv6 Proxy can be performed SLB/ADC appliance
- These major vendors have significant IPv6 capabilities
  - A10 AX Series Application Delivery Controller (ADC)
  - Brocade ServerIron ADX
  - Cisco ACE 30 & ACE 4710
  - Citrix NetScaler 9.3
  - F5 BIG-IP Local Traffic Manager (LTM)
  - Riverbed (was Zeus and Aptimize)

Other Commercial Solutions

- There are other commercially-available IPv6 products on the market

  - Array Networks
  - BalanceNG V3
  - CoyotePoint Systems Equalizer
  - Exceliance Aloha
  - IBM WebSphere Application Server Load Balancer 6.1
  - Microsoft PortProxy
  - Microsoft Windows Server 2008 Network Load Balancing (NLB)
  - Radware AppDirector 2.20
  - Rackspace.com Cloud Load Balancers

Open Source Solutions

- There are also open source solutions available for organization who want to set up a quick and inexpensive deployment.
  - Apache 2.X mod_proxy.so
 - IPVS
  - Loaded
  - Nginx
  - Pound

IPv6 Features in SLBs/ADCs

- Organizations should look for products with the following characteristics

  – IPv6 capabilities for SLB and reverse proxy functions
  – SSL offload with IPv6
  – SYN-cookies for IPv6 connections
  – High-availability for IPv6 connections (synchronization of IPv6 state information between HA pairs)
  – ICMPv6 filtering
  – Ability to check the IPv6 neighbor cache entries
  – Stateful ACLs for IPv6 packets
  – Denial of RH0 packets
  – IPv6 static routing
  – Ability to perform content filtering, regular expression matching, URL rewriting, for IPv6 connections
  – IPv6 management access
  – Logging of IPv6 events on the SLB appliance

SLB/ADC Deployment Options

- In-line as a layer-3 proxy-server
  - Public addresses on the external interface and private addresses on the internal interface
  - Fully-Stateful – TCP Normalization security benefit
  - With IPv6 no reason to use private (ULA) addresses behind SLB/ADC
- Virtually in-line as a proxy server
  - Uses Source-NAT, Policy-Based Routing (PBR)
  - Can allow Direct Server Return (DSR) – non-stateful
  - Servers can have SLB/ADC as their default gateway
- Layer-2 bridge between two VLANs or subnets
  - Uses BVI or proxy and/or Source-NAT
- Virtual appliance at the hypervisor layer
  - VMs use the virtual appliance as their proxy-server or default gateway

Virtualized Solutions
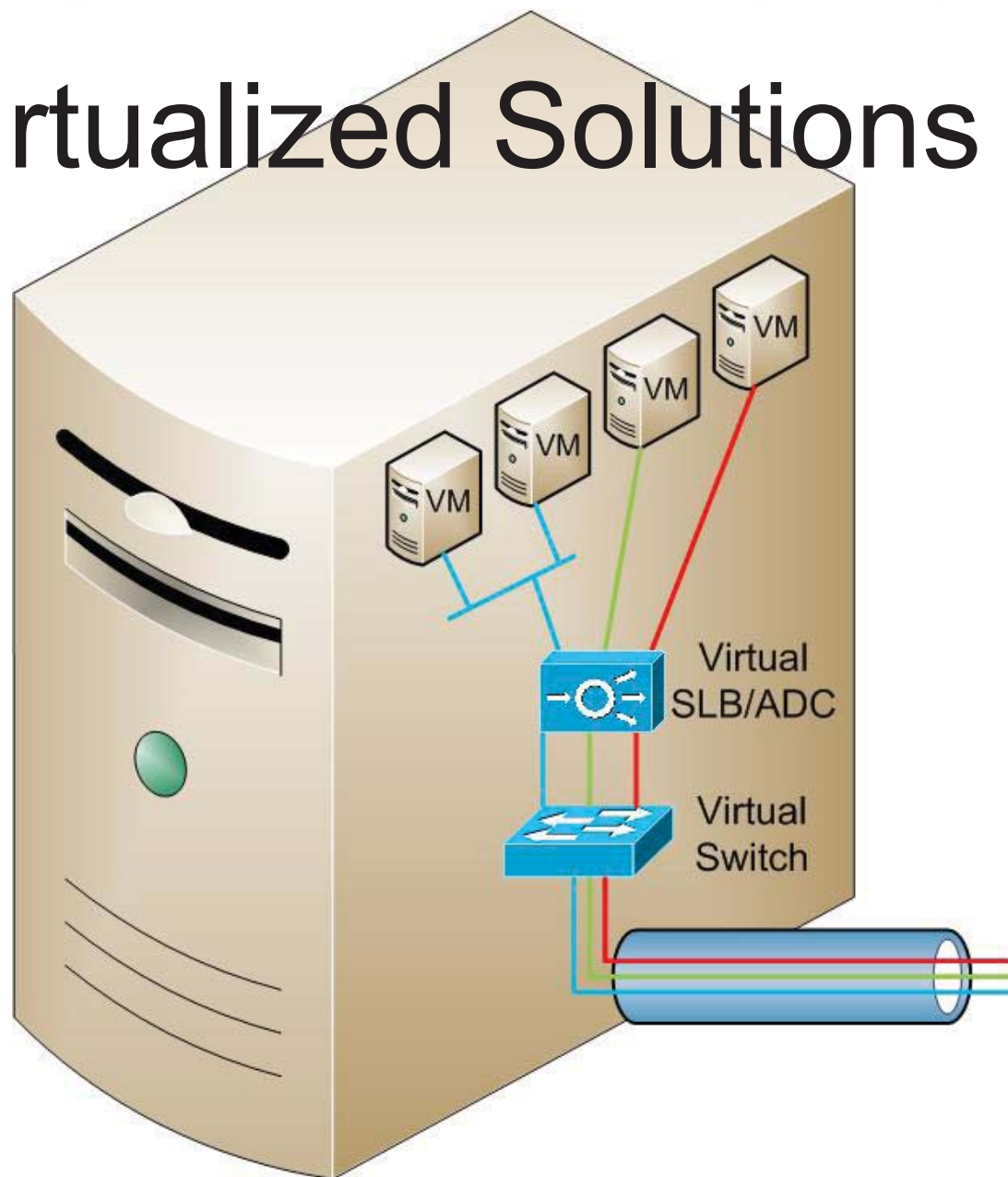
Summary

- An IPv6-enabled Internet already exists.
- An IPv6 transition is already underway in the U.S. Federal Government and other parts of the world.
- Your IPv6 infrastructure and Host OSs are ready now!
- Regional Internet Registries (RIRs) have IPv6 addresses to give you.
- Service providers have initial IPv6 services and are continuing to expand their deployments.
- You may already own IPv6-capable routers, firewalls, and SLB/ADC systems.
- The cost to deploy IPv6 at your organization's Internet edge is minimal.
- It just requires some of your time to set it up.
- Now is the time to deploy IPv6!